MANITOBA

ANNUAL REPORT

1982-83

Mineral Resources Division

The Department of Energy and Mines

84- 3367 /

MANITOBA

ANNUAL REPORT

1982-83

Mineral Resources Division

The Department of Energy and Mines

The Honourable Pearl McGonigal

Lieutenant Governor of the Province of Manitoba

May it please your Honour.

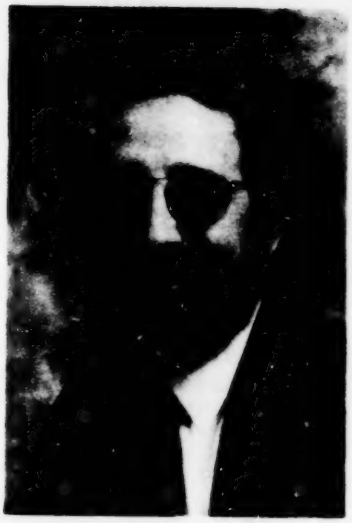
I have the honour of presenting to you the Annual Report of the Mineral Resources Division of the Department of Energy and Mines for the fiscal year ending March 31, 1983.

This report records the activities of the Mineral Resources Division and the performance of the mineral resources industry of the province during the year.

Wilson D Parasiuk

Wilson Parasiuk,

Minister.



The Honourable Wilson Parasiuk

Minister of Energy and Mines

Dear Sir:

I have the honour to present the Annual Report of the Mineral Resources Division of the Department of Energy and Mines for the fiscal year ended March 31, 1983. The report contains a descriptive and statistical record of activities and achievements in the mineral resource sector during the year.

Marc Eliesen

Marc Eliesen,

Deputy Minister.

TABLE OF CONTENTS

Highlights of the Year 1982/83 7

Mineral Resources Division 8

Economic and Policy Analysis 9

Mines Branch 10

Mining Recording Section 10
Aggregate Resources Section 10
Geoscience Data Section 10
Mining Engineering and Inspection Section 11

The Mining Industry 12

Mineral Production 12
Mining and Processing Operations 12
Industrial Minerals/Structural Materials 17
Mineral Exploration 17

Petroleum Branch 19

Administration Section 19
Engineering and Geology Section 19
Petroleum Inspection Section 19

The Petroleum Industry 19

Petroleum Production and Exploration 19
Lease Sales 21
Petroleum Royalties and Taxes 21
Oil Pricing Agreement 21
Manitoba Drilling Incentive Program 21

Oil and Natural Gas Conservation Board 21

Geological Services Branch 22

Lynn Lake Programs 22
Precambrian Mapping 24
Mineral Deposit Studies 24
Industrial Minerals Stratigraphic Drilling Program 24
Laboratory Services 24
Rock Preparation Laboratory 24
Publications 24

Statistical Supplement 1982/83

Table 1 Comparison of Manitoba Mineral Production and Value 1981 and 1982 (Calendar year) 26
Table 2 A Comparison of Value of Manitoba Metals, Industrial Minerals, Fuels and Total Mineral Production from 1972-1982 (Calendar Year) 27
Table 3 Mineral Dispositions in Good Standing at Calendar Year End 1978 to 1982 28
Table 4 Mineral Dispositions Issued each Calendar Year 1978 to 1982 29
Table 5 Revenue from Mining and Quarrying (to March 31) 30
Table 6 Manitoba Petroleum Statistics 1973-1982 (Calendar Year) 31
Table 7 Oil and Water Production Summary (to December 31) 32
Table 8 Crude Oil Sales, Deliveries, Transporters' Disposition 1982 33
Table 9 List of Publications and Presentations 1982-83 34
Table 10 List of Preliminary Geological Maps – 1982 35

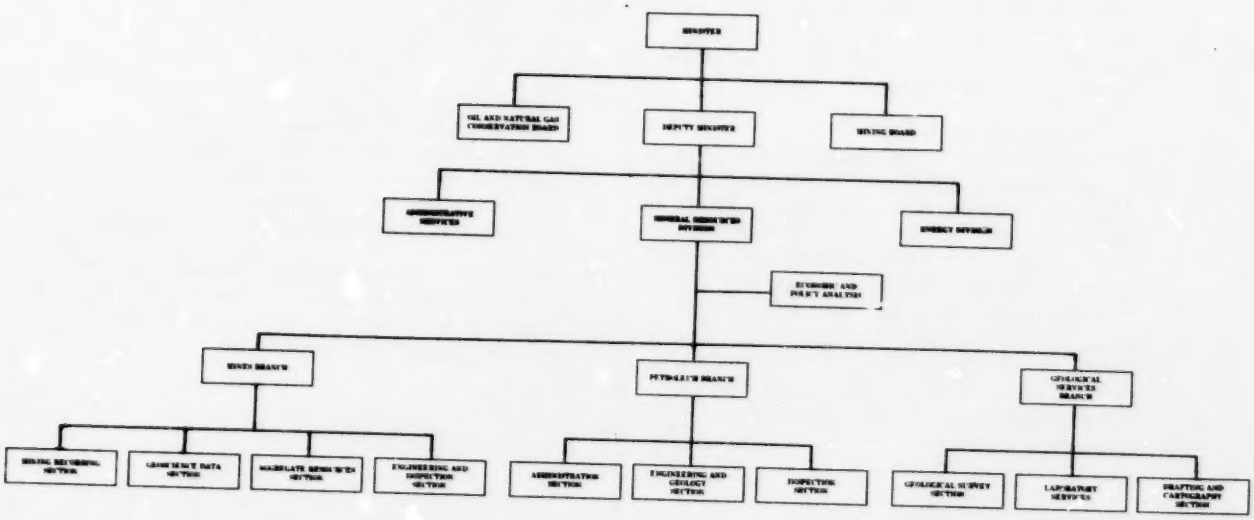
Highlights of the Year

- The value of minerals, including fuels, produced in the province during 1982 was $550.3 million, down from $657.9 million in 1981, and $820.6 in 1980. This decline reflects the worst recession the industry has experienced since the early 1930's.
- Expenditures on mineral exploration during 1982 were estimated at $17.1 million, a decline of 46% from the $31.7 million recorded in 1981.
- Staking activity during 1982, as reflected in the area of claims recorded, declined almost 50% from the previous year. The total area of dispositions in good standing at year end, however, decreased only slightly.
- At the Hudson Bay Mining and Smelting Co. Limited complex in Flin Flon, there was an 8-week summer shutdown of all operations. All development work at the Stall Lake and Rod mines was suspended after the shutdown.
- Development of the Trout Lake mine continued during the year and production has reached the scheduled 1,800 tons per day by year end.
- There was a 3-month shutdown of Inco's operations at Thompson from November 1982 to January 1983. Work on the new Thompson Open Pit commenced early in the year but in August, the Company announced a one-year postponement of the project due to severely depressed metals markets.
- Following a 38% reduction in the work force at the beginning of 1982, there was a 15-week summer shutdown of the operations of Sherritt Gordon Mines Limited at Lynn Lake and Leaf Rapids. At the Fox Mine, work proceeded on the equipping of an 8-foot diameter borehole to facilitate hoisting of ore from deeper levels of the mine to the 2000 level. At the Ruttan Mine, following the layoffs at the start of 1982, production was reduced and a decision taken to selectively mine higher grade ore as a temporary measure.
- A program of shaft deepening and underground drilling at the Agassiz mine was completed by Sherritt Gordon Mines Limited in June and a feasibility study initiated.
- Due to depressed market conditions and build-up of inventories, production of tantalite concentrates by Tanco was suspended indefinitely at the end of December 1982.
- Brinco Mining Ltd. which brought the San Antonio gold mine in Bissett into production for a brief period, closed operations in May and embarked on an exploration program directed at the lower levels of the mine.
- Revenue to the government from mining and quarrying declined to $1.1 million from $15.8 million for the 1981-82 fiscal year.
- Oil and gas exploration increased dramatically during 1982. Of a total of 195 wells drilled, 174 were completed as potential oil wells, an 84% success rate. By the end of 1982, Manitoba oil producers had qualified for approximately $11.8 million in New Oil Reference Price and Special Old Oil Price supplements under the new pricing agreement between Manitoba and the Federal Government.
- Two Crown oil and natural gas lease sales during 1982 netted $1.07 million in revenue for the government.
- Revenue from oil and gas royalties, taxes, rentals and other administrative fees for the year was approximately $15.6 million.
- A total of 17 major field projects were undertaken by the Geological Services Branch during the year, with a strong emphasis on the Lynn Lake area through programs designed to accelerate the evaluation of the district's mineral potential.
- Results of aeromagnetic gradiometer surveys in the McClarty Lake (Snow Lake) and Lynn Lake regions were released in March 1983 and November 1982 respectively.

Mineral Resources Division

The Mineral Resources Division is responsible for the administration of the provincial Mines Act and Regulations governing the exploration, development and production of provincial mineral resources and the safety and health of the employees in mining, smelting and refining operations; for the conduct of geological investigations directed towards providing a data base for mineral resource exploration, evaluation and development; and for monitoring the effect of provincial mineral policy on the mining and petroleum industries of the province.

Department of Energy and Mines



Economic and Policy Analysis

The function of this section is to undertake analysis and evaluation of the economic and policy impact of provincial, national and international mineral developments on the provincial mineral industry, and to assist in policy development and implementation. Studies conducted by the section contribute to effective management of the provincial mineral resources and the maintenance of appropriate and effective mineral and mineral tax policies. Staffing remained at one Senior Advisor and one Economic Research Analyst.

The section is responsible for the collection and analysis of provincial mining statistics. This function is carried out both by direct provincial surveys of mine and mill production, and through agreements with the Federal Department of Energy, Mines and Resources and Statistics Canada, by undertaking on behalf of these agencies surveys of Manitoba mining and exploration companies. A survey of exploration companies active in the province is conducted by the section in December of each year to provide an estimate of exploration expenditures in the current year and a forecast for the forthcoming year.

Revenue from the mining and quarrying under The Mines Act, The Mining Royalty and Tax Act, and The Mining Tax Act for the fiscal year 1982/83 was estimated at $1,132,523 compared with $15,846,229 for the previous year (see Table 5). This decline largely occured in the metallic minerals sector which was severely affected by recessional conditions resulting from collapse of metals prices and widespread closures of operations.

Staff of the section undertook, during the year, evaluation and provided recommendations on various federal/provincial matters dealing with the mineral industry for responsive action by senior management. They also participated in the work of two special task forces set up by Federal and Provincial Ministers of Mines to deal with problems of Communities Solely Dependent on Mining and Taxation of Junior Mining in Canada. Both of these task forces completed their work and reported to Ministers in the later half of the year.

Numerous mine closures during the year and concern for the welfare of the mine employees and dependent communities demanded government action in job creation programs and in consideration of various policy options for dealing with the situation. Staff of the section were fully engaged in these activities and in closely monitoring developments.

Mines Branch

The Mines Branch, through the activities of its component sections, is responsible for administration of matters relating to the operation of mines, including the health and safety of employees of mining, smelting and refining operations; the recording of mineral dispositions; monitoring of exploration activities and reviewing assessment reports; the rehabilitation of mining lands; aggregate resource inventory studies; and the implementation of provincial land use policy concerned with the conservation of aggregate resources.

Mining Recording Section

The Mining Recording Section maintains recording offices in Winnipeg and The Pas to administer regulations under The Mines Act governing the disposition of Crown mineral rights other than oil and natural gas. The regulations enable individuals and companies to acquire claims, permits and leases for the right to prospect, develop and mine Crown minerals. The Recorders and their staff process applications for these mineral dispositions; monitor and inspect the activities of the disposition holders; collect fees, rent, royalties and refundable performance deposits; maintain records; and generally deal with enquiries relating to these functions.

Mineral dispositions in good standing at the end of 1982 are given in Table 3. Details of Crown mineral dispositions issued during the year are given in Table 4. During the calendar year 1982, 643 mining claims were recorded for a total area of 115 703 hectares (285,908 acres) compared with 223 845 hectares (553,133 acres) in 1981. This was largely attributable to the depressed state of the industry and a cooling off of the previous year's high level of staking of gold properties, particularly in the southeastern part of the province.

The total revenue collected by the Section during the fiscal year was $907,969, comprising $368,287 from dispositions, other fees and rentals; $76,616 from Mining Claims Lease Taxes; and $463,066 from royalties on industrial minerals (see Table 5).

Aggregate Resources Section

The Aggregate Resources Section undertakes detailed surficial geological mapping and aggregate resource inventories, and prepares quarry mineral land use recommendations based upon provincial land use policies. Resource inventory data and resource management proposals are supplied to government, municipalities and private sector users on demand.

Mapping of the Quaternary geology and economic evaluation of sand and gravel deposits were undertaken by staff geologists in the Portage la Prairie region, the Rural Municipality of Bifrost and the Local Government District of Fisher. Preliminary field investigations were also initiated in the Rural Municipality of Franklin and the Local Government District of Stuartburn in southeastern Manitoba. Selected bedrock formations in Churchill and southern Manitoba were evaluated for potential use as aggregate.

In response to requests from Municipal Planning Districts, recommendations for the protection of quarry mineral resources were presented to four Municipal Planning Districts and several villages. The recommendations were supported by technical background reports and maps illustrating the proposed planning status of each economic quarry mineral deposit. Guidelines were provided for the rehabilitation of depleted pits and quarries. In addition, three presentations were made at municipal council meetings concerning the protection of quarry mineral resources. An estimated 1,500 land subdivisions and all proposed Crown land transfers were reviewed and, where necessary, recommendations made to minimize potential conflicts with mineral extraction.

One Open File Report and three Preliminary Maps were released during the year. Staff geologists also presented a poster session and co-authored a field trip guidebook for the Geological Association of Canada/Mineralogical Association of Canada joint annual meeting held in Winnipeg in May, 1982. Publications, Preliminary Maps and presentations by the Section are listed in Tables 9 and 10.

Geoscience Data Section

The Geoscience Data Section provides support services to mining companies and prospectors carrying out exploration in Manitoba. The Section assesses reports of exploration work on mineral dispositions for compliance with the requirements of regulations under The Mines Act; disseminates non-confidential exploration data; distributes geological publications; collects and stores diamond drill core; compiles exploration and mineral deposit data as reports and maps; monitors, promotes and documents exploration activity in the Province; performs land-use, mineral potential (capability) studies; and maintains the Division's library. During 1982 the Section also contributed to the establishment and management of mineral-related job creation projects in northern Manitoba.

During the fiscal year April 1, 1982 to March 31, 1983, 147 reports of exploration work were received, assessed and microfilmed by the Section; 55 reports were added to the non-confidential files; and 532 files were reproduced for the private mining sector. A total of 1,365 open files were examined by mining industry personnel. A new master "Index to Non-confidential Assessment Reports" compiled from the CLASS computer file of exploration data was issued in November. Map plotting of the areal extent of work contained in non-confidential assessment reports, at the same scale as Manitoba claim maps (1:31 680) were compiled as 600 individual index map mylars.

Also, during the year, 1,158 orders for geological publications were received. A total of 3,003 reports and maps were sold, generating over $13,000 in revenue, and an additional 2,910 complimentary copies were distributed.

In January, 1983, the diamond drill core acquisition and storage program was rejuvenated with the hiring of a permanent drill core geologist. As of the end of the fiscal year, the Province's drill core inventory was 120 509 metres (395,370 feet), stored at four regional core libraries — Lynn Lake (18 651 metres or 61,190 feet), The Pas (64 100 metres or 210,301 feet), Thompson (34 100 mnetres or 111,877 feet) and Winnipeg (3 658 metres or 12,000 feet). This core is provided on a voluntary basis by mineral exploration companies who, in turn, receive exploration work credits for retrieval and transportation costs. The non-confidential core is available for examination thus helping to eliminate the need for costly duplication of diamond drilling, and allowing for more productive use of exploration dollars.

An evaluation of the geophysical data of the Lynn Lake Greenstone Belt was carried out to outline targets for base metal and gold exploration. Accompanying mineral deposit compilations were also completed for the Belt as part of the on-going mineral inventory project.

Airborne magnetic gradiometer surveys of the McClarty Lake area were carried out under Federal-Provincial agreement and this completed the coverage of the southern part of the Flin Flon-Snow Lake area. A portion of the Lynn Lake Greenstone Belt was also covered. Interpretation of the gradiometer data is in progress.

Displays related to exploration, mining and the geology of the Province were presented by the Section at the Annual G.A.C.-M.A.C. Meeting (May 17-19); Winnipeg Gem and Mineral Show (June 16-19); Annual "Meeting with Industry" (November 18); Manitoba Schools Careers Symposium (February 4-6) and at the Prospector's and Developer's Association Annual Meeting in Toronto (March, 1983).

The Section was responsible for examining land-use requests in order to avoid future conflicts in areas of high metallic mineral potential. Mineral potential (capability) maps were prepared in response to specific requests and staff served on land-use committees.

The Section was involved in a number of mineral-related job creation projects, under the Province's two Job Creation Programs at Lynn Lake and Thompson during temporary mine closures. From August to October, 1982, drill core was collected and stored at Lynn Lake and line cutting was carried out. From January to March, 1983, five projects were completed around Thompson. These were: collection of 26 000 metres of Nickel Belt exploration drill core; construction of a core inspection room and core racks; experimental ground gradiometer surveys; line cutting; and trailer repairs and transport. Approximately 300 person-weeks of work were created.

Mining Engineering and Inspection Section

The Mining Engineering and Inspection Section administers regulations under The Mines Act governing the operation of mines and the rehabilitation of quarries, and enforces the Workplace Safety and Health Act and regulations at mines. These functions are carried out by Mines Inspectors located in Winnipeg, Thompson, Flin Flon, Snow Lake, Leaf Rapids and Dauphin, and District Mining Engineers located in Winnipeg, Flin Flon and Thompson.

In 1982, 1806 inspections and investigations were conducted to determine compliance with The Mines Act and Regulations and the Workplace Safety and Health Act, and to investigate reported dangerous occurrences. One prosecution was concluded in 1982. A total of 127 environmental surveys were conducted to assess in-plant environmental conditions as well as 19 inspections of abandoned mines.

The Section continued to monitor the adequacy of mine rescue facilities at mines and during the year 158 mine rescue personnel were given mine rescue training.

Three rehabilitation plans for commercial quarries were received and appraised during the year and 606 casual permits for removal of Crown quarry minerals were issued. Background information and recommendations relating to quarrying and rehabilitation were provided to four Municipal Planning Districts.

The Mining Industry

Mineral Production

The value of mineral production, including metals, industrial minerals and fuels, for the 1982 calendar year was $550.3 million compared with $657.9 million for 1981, a decrease of 16.4%. Lower unit prices for metals and lower production during the year were primarily responsible for this decrease (see Tables 1 and 2 in Statistical Supplement). Poor metals markets and declining prices forced Manitoba base metal producers to institute production cutbacks and shutdowns in an attempt to maintain the balance between supply and demand and to keep inventories under control.

At $353.2 million (down 26.2%), metals accounted for 64% of the total value of Manitoba's 1982 mineral production. The value of the more significant metals produced during 1982 were: nickel $171.7 million (down 26.8%); copper $95.2 million (down 23.1%); zinc $33.7 million (down 28.7%); gold $25.9 million (up 11.9%); cobalt $10.3 million (down 26.4%); silver $8.00 million (down 23.2%); and tantalum $7.2 million (down 68.7%).

Mining and Processing Operations

Base Metals

Mining operations in Manitoba are currently located in the Flin Flon-Snow Lake area, the Lynn Lake-Leaf Rapids area, and at Thompson, Bernic Lake and Bissett (see Map 1).

Hudson Bay Mining and Smelting Co., Limited operates a number of mines in the Flin Flon-Snow Lake area, concentrators at Flin Flon and Snow Lake, and smelting (copper) and refining (zinc and cadmium) facilities at Flin Flon. Besides treating ores from the company's own mines, concentrates of other operators, mainly Sherritt Gordon Mines Limited and the Trout Lake mine, are treated on a custom basis. The main products from the complex are anode copper, refined zinc, refined cadmium and lead concentrate. At the end of 1982, approximately 1800 people, including contractors, were employed at the various mines and processing facilities in Manitoba*. Total reserves at the company's Flin Flon and Snow Lake mines were reported at the end of 1982 to be 15,744,000 tons grading 2.66% copper, 2.8% zinc, 0.035 oz/ton gold and 0.51 oz/ton silver. In the Snow Lake area, the company operated five mines and began development of a sixth, the Rod Mine. Construction of a 3,800 ton per day concentrator at Stall Lake began in 1977 and the plant was inaugurated in June 1979 producing copper and zinc concentrates which are shipped to Flin Flon for further processing, and lead concentrates which are shipped to Trail, B.C.

Normal production was interrupted for an 8-week summer shut-down of all operations. At Stall Lake, the sinking of No. 4 Shaft, an internal winze to develop the downward extension of the main ore zone, was deferred after the shut-down. At the Rod Mine, shaft sinking was completed but further development was deferred. The first ore from the Spruce Point Mine was produced in January 1982 and production was gradually built up during the year to the scheduled output of 720 tons per day. In the Flin Flon area, the Flin Flon, Centennial, Westarm and White Lake mines were operated during the year except for the shut-down period. Under a joint venture agreement, (Hudson Bay Mining and Smelting Co., Limited 44%, Scandinavian Minerals Syndicate 29%, and Manitoba Mineral Resources Ltd. 27%) development of the Trout Lake mine continued during 1982. Production was gradually increased to the scheduled 1,800 tons per day by year-end.

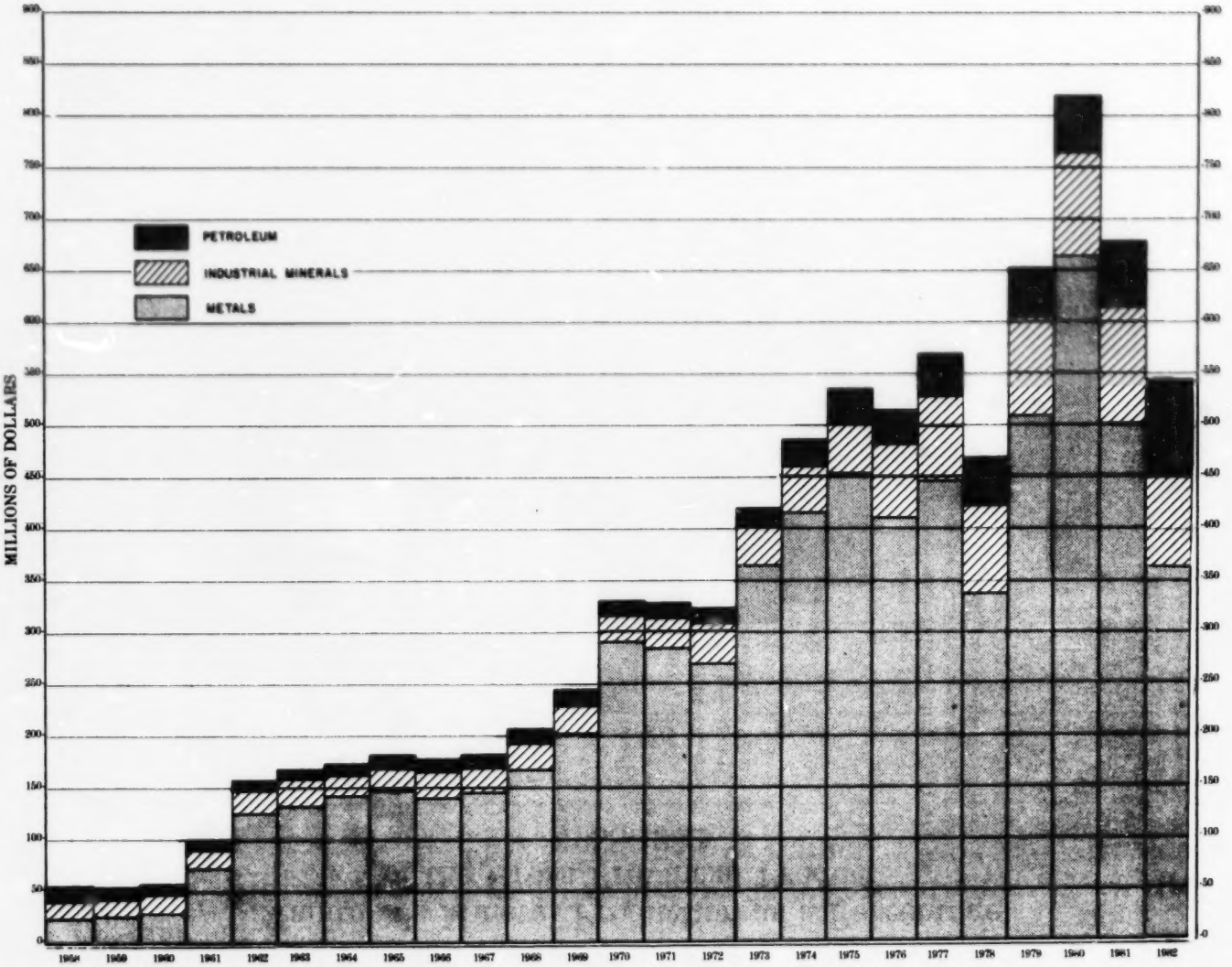
Inco Limited operates two mines, a concentrator, smelter and nickel refinery at Thompson. Ore production during 1982 came from the Thompson Mine and Pipe #2 Open Pit. The Birchtree Mine remained closed on a standby basis. The Soab North and South Mines and the Pipe #1 Mine were permanently closed and surface openings capped. The main product from the Thompson complex is electrolytic nickel. By-products include copper matte, cobalt oxide and pentlandite concentrate. Copper matte is shipped to the company's refinery at Copper Cliff, Ontario, while commercial grade cobalt oxide is shipped to the company's refinery at Clydach, Wales, where refined cobalt oxides and salts are produced. Pentlandite concentrates are sold as feed for Sherritt Gordon's nickel refinery at Fort Saskatchewan, Alberta.

Operations were totally shut down for a period of three months commencing in November 1982 and extending until the end of January 1983 owing to severely depressed nickel markets. Thereafter, a four-day week work schedule was implemented and remained in force at the close of the fiscal year. An average of 2,214 persons were employed at the company's Manitoba operations during 1982. Inco's ore reserves in the Thompson area are said to be in excess of

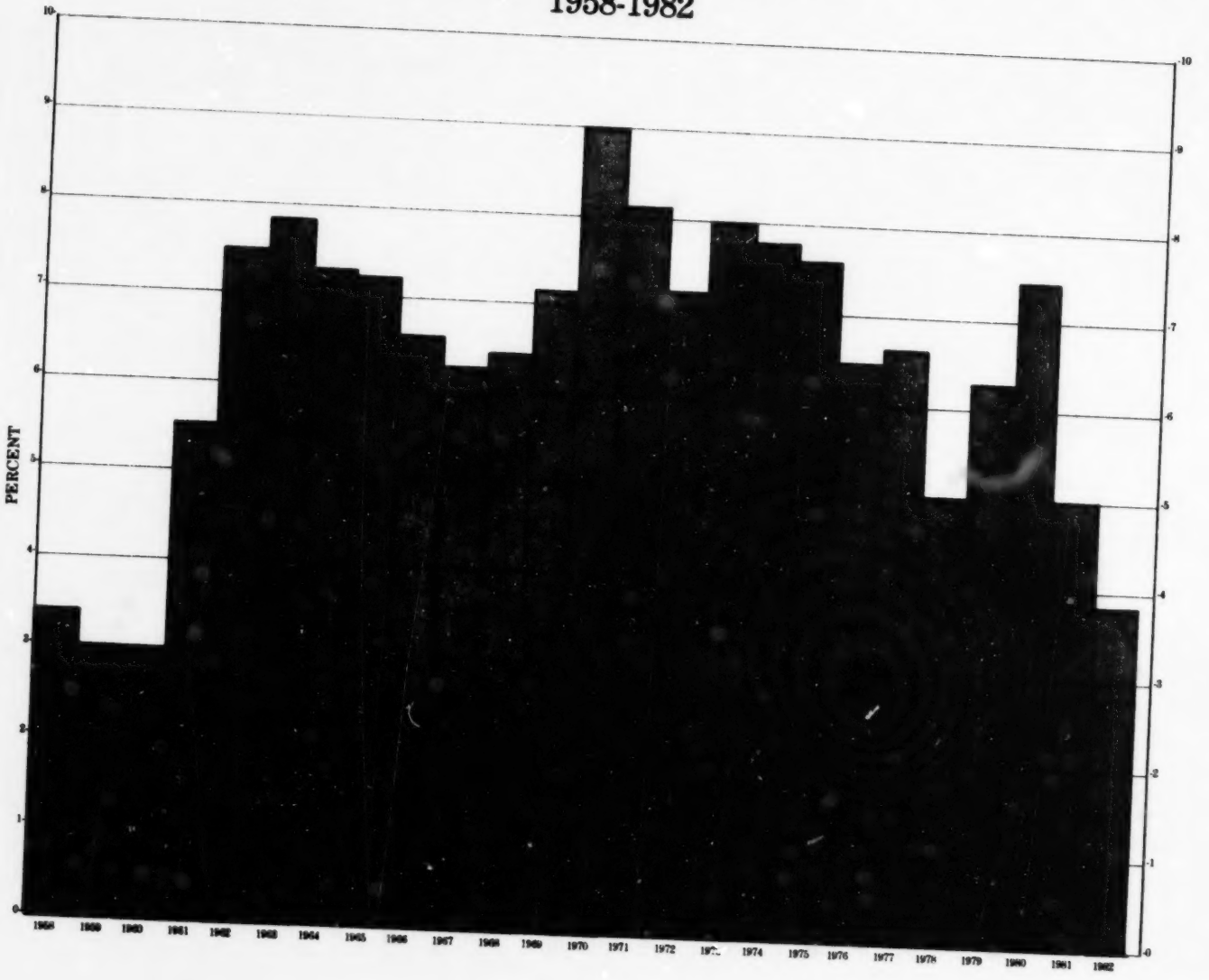
---

*An additional 360 people were employed in the facilities on the Saskatchewan side of the border.

Gross Value of Manitoba's Mineral Production
1958 — 1982
(Current Dollars)



Manitoba's Mineral Production as a Percentage of the Gross Provincial Product 1958-1982



70 million tons containing about 1.8 million tons of nickel, and at current production levels will last well into the next century.

The Thompson Mine is serviced by two shafts, the T-1 shaft to the 4340 level and the T-3 shaft to the 2600 level. The Pipe #2 open pit mine is 2,000 feet long, 1,600 feet wide and will have eighteen 40-foot benches to its ultimate depth of 720 feet. A 22 foot diameter concrete-lined shaft to 3,600 feet has been completed at this mine. During 1982, it was used mainly to service pumping facilities on the 1500 level to provide drainage for the open pit. The concentrator at Thompson processed approximately 13,000 tons of ore per day when operating.

In October 1981, Inco had announced the development of an open pit at Thompson to replace the Pipe open pit where ore was expected to be exhausted by 1984. The first phase of the new development was estimated to cost $87 million, and would involve the removal of 26 million cubic yards of overburden by dredging. In 1982, the site was prepared, roads constructed for the discharge pipelines, and a barge assembled for the dredging operation. In August, however, a one-year postponement was announced, due to severely depressed metals markets.

Sherritt Gordon Mines Limited operates two mines and concentrators in the Lynn Lake-Leaf Rapids area. At the end of 1981, a decision was made to reduce tonnage and to mine higher grade ore at both the Fox and Ruttan mines in an attempt to reduce operating losses resulting from severely depressed metal markets. The daily average production rates for the Ruttan and Fox mines during 1982 were reduced to 4,800 tons and 2,500 tons respectively. As a consequence, Sherritt's Manitoba workforce was also reduced by 38% to 734 employees by the end of 1982. Continuing low metal prices during the first half of 1982 resulted in a 15-week shutdown of Sherritt's mining operations in mid-June.

Production at the *Fox Mine*, located 30 miles south west of Lynn Lake, is from blast-hole stopes with an adaptation of this method for pillar recovery. Ore below the 2000 level, the lowest level serviced by the shaft, is developed by a ramp which was extended to the 2800 level during 1982. To facilitate hoisting of ore from this area, an 8-foot diameter borehole was equipped for hoisting ore to the 2000 level. The concentrator at this mine produces copper and zinc concentrates which are trucked to the load-out facilities at Lynn Lake for rail shipment. Zinc and copper concentrates are processed at Flin Flon. Ore reserves at this mine, as of January 1, 1983, were estimated at 1,910,000 tons averaging 2.34% copper and 1.58% zinc.

The *Ruttan Mine*, located 75 miles southeast of Lynn Lake, commenced production in 1973 from an open pit. In 1974, development of the underground mine was initiated with a decline and conveyorway. The decline has been extended to the 1400 level and a service shaft sunk to the 1000 level. In 1980 this shaft was extended to the 2230 level to permit detailed subsurface drilling of the downward extension of the orebodies. In 1982, a drilling program to outline ore between the 1400 and 2200 levels was completed, and feasibility studies for mine deepening to the 2200 level initiated.

At December 31, 1982, ore reserves at the Ruttan Mine, recalculated using a 1.5% copper cut-off grade, were estimated at 15,643,000 tons grading 1.74% copper and 1.02% zinc. Approximately half of this ore is in the developed area of the mine above the 1400 level, with the remainder located between the 1400 and 2200 levels. The ore zone is open at depth.

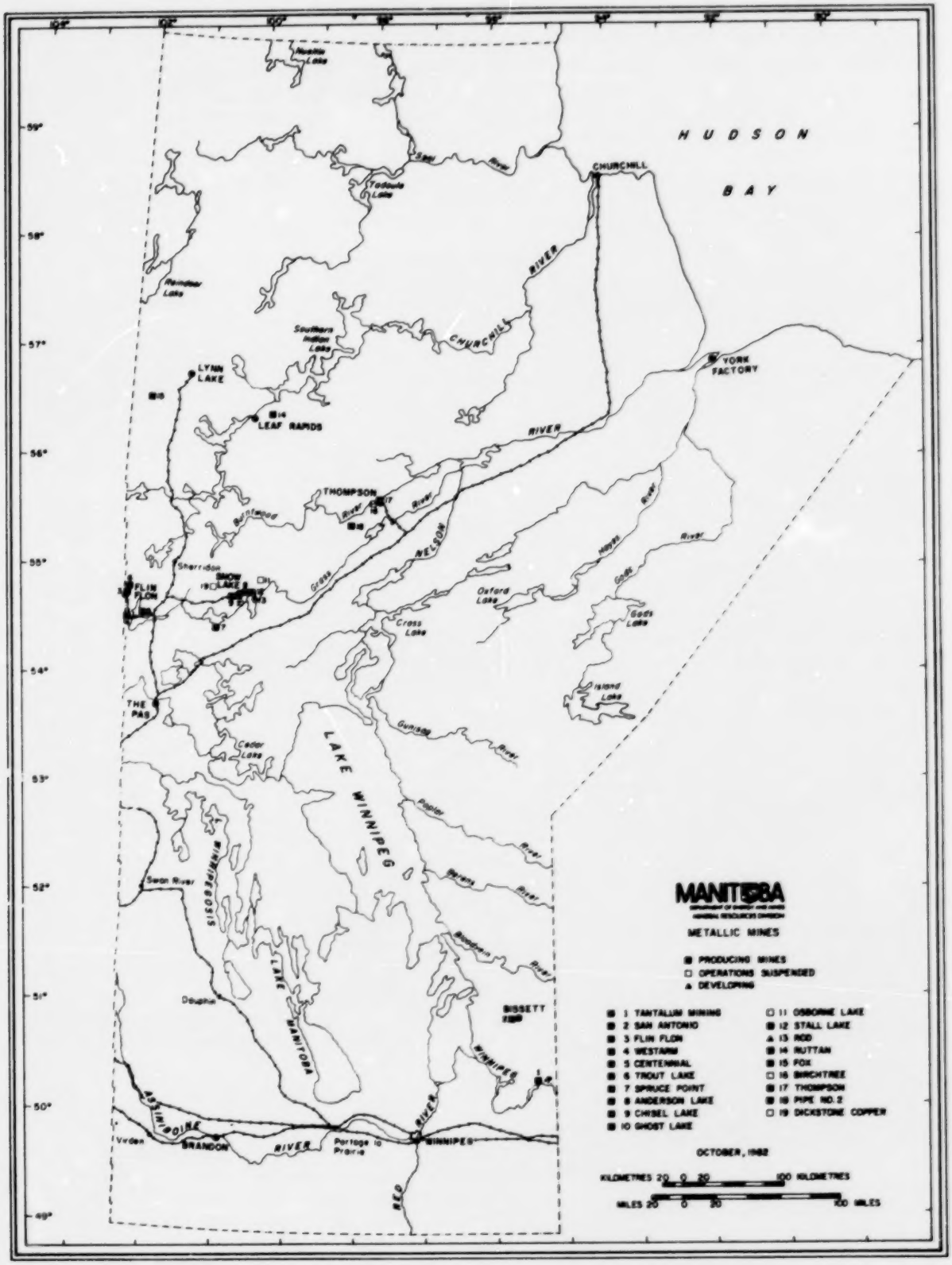
Copper and zinc concentrates produced by the mill are trucked to Lynn Lake for rail shipment. However, in 1982 no zinc concentrates were produced. Copper concentrates were treated at Flin Flon as capacity permi..ed, the balance going to Noranda, Quebec.

In 1979 Sherritt Gordon Mines Limited acquired an option on the *Agassiz gold property*, now held by Comiesa Corporation, a subsidiary of Agassiz Resources Ltd. Sherritt Gordon Mines Limited carried out surface diamond drilling in 1980 and continued the evaluation in 1981 by deepening the shaft to 835 feet and establishing a new exploration level at 800 feet to permit deeper drilling. This program was completed in June, 1982, and the shaft allowed to flood.

Tantalum Mining Corporation of Canada Limited (Tanco)

Production of tantalite concentrates continued during 1982. The mill processed 142,000 tons of ore from underground and reprocessed 38,000 tons of tailings.

Mill recoveries improved significantly as a result of revisions to the circuit, improved operating procedures, and the decision to reduce throughput from 1,000 to 800 tons per day. The mined ore was very close to reserve grade of 0.12% tantalum oxide. Market conditions were depressed all year and inventories continued to build. As a consequence, production was suspended indefinitely at the end of December 1982.



Map 1 Location of Metallic Mines

Ore reserves as at December 31, 1982, were reported to be 1,081,000 tons tantalite ore with a drill indicated grade of 0.138% Ta_2O_5 and 702,000 tons of stored tailings grading 0.065% Ta_2O_5. Lithium and cesium ore reserves are reported as 7,750,000 tons grading 1.76% LiO_2 and 300,000 tons grading 23% Cs_2O, respectively.

Precious Metals

San Antonio Joint Venture Ltd.

In August 1980, *Brinco Mining Ltd.* and New Forty-Four Mines Limited signed a joint venture agreement to reactivate the San Antonio gold mine in Bissett. The former operation had been dormant since 1968 when a fire destroyed the hoistroom. The mine is developed by a shaft and three winzes to a total depth of 4,980 feet.

During 1982, 86,191 tons of ore grading 0.14 ounces per ton gold were processed and 11,210 ounces of gold and 1,901 ounces of silver recovered. This tonnage includes 14,000 tons of ore from nearby mining properties, including the Lotus property developed as a joint-venture with Esso Minerals. Neither recovered tonnage nor grade at the Lotus compared favourably with estimates of pre-development ore reserves and operations were terminated in August.

During 1982, the original joint-venture arrangement between Brinco and New Forty-Four Mines Ltd. was renegotiated. Under the new arrangements, Brinco's interest in the mine was increased from 50% to 100% with New Forty-Four Mines Ltd. retaining a 10% net profits interest, payable after Brinco has recovered its costs associated with development and operation of the mine.

Whiteshell Resources Ltd. completed exploration and feasibility studies on its properties near Star Lake in the Whiteshell Park. A detailed development program was submitted for review by the Parks Branch of the Department of Natural Resources.

Augusta Gold Mines Ltd. contracted with San Antonio Joint Venture Ltd. for processing of stockpiled ore at the former Packsack mine. Gold recovery was limited but further exploration is planned.

Industrial Minerals/Structural Materials

The production and value of industrial minerals and structural materials are given in Table 3 in the Statistical Supplement.

A large face-brick plant at Lockport, near Winnipeg, is operated by Red River Brick and Tile Co., using stoneware *clay* from the Ste. Rose du Lac area, *shale* from the Pembina Mountain area, and *sand* from local sources.

Non-swelling bentonite, used mainly in clarification of petroleum and vegetable oil, is mined by Pembina Mountain Clays near Morden and shipped to the company's plant in Winnipeg for processing.

Gypsum is produced by Domtar Inc. at Gypsumville for use in the company's wallboard plant in Winnipeg. Westroc Industries also produces gypsum at Harcus, near Amaranth for its wallboard plants in Winnipeg and Saskatoon.

Portland Cement is produced at Fort Whyte, near Winnipeg, by Canada Cement Lafarge and Inland Cement Industries, using limestone from quarries near Steep Rock. *Limestone* is also quarried north of Mafeking to supply a cement plant in Regina. Cement production at both plants was suspended in September, 1982, due to a combination of poor market demand and high operating costs.

Steel Brothers Canada produces *lime* from kilns at Winnipeg and Faulkner. *Limestone and dolomite* are quarried at Garson for *building stone* and crushed rock is produced by numerous operators in the Interlake region and elsewhere. Cold Spring Granite (Canada) Limited and Midwest Quarries Limited operate two *granite* quarries in the Lac du Bonnet area for building stone. High quality *silica sand* from Black Island in Lake Winnipeg is exported for use in glass-making, as foundry sand, for sand blasting, and as a filtering medium.

Peat moss is produced from sphagnum bogs in southeastern Manitoba and used for horticultural purposes. Fisons-Western Peat Corp. operate in 4 bogs near Julius and Elma. Premier West Peat Moss Ltd. began preparation of the Giroux bog for production in 1983. Both companies will produce a "value-added" product, combining fertilizer with the peat moss.

Mineral Exploration

Expenditures on mineral exploration in Manitoba during 1982 totalled $17.1 million, a decline of 46% from the $31.7 million recorded in 1981. This decline was directly attributable to the world wide depressed state of the mineral industry.

The total acreage of claims recorded in the province during the year dropped to 115 703

hectares from 223 845 hectares for 1981. However, mineral dispositions in good standing at end of 1982 remained at a relatively high level totalling 1 147 720 hectares compared with 1 214 729 hectares at the end of 1981.

Base metals continued to attract a significant share of exploration activity in the province, particularly around existing mining centres. Exploration for gold remained at a high level during the year. No *potash* nor *uranium* exploration programs were reported during the year.

Base Metals

In the *Flin Flon-Snow Lake-Sherridon* belt, exploration activities for base metals included geological, geophysical and diamond drilling programs. Companies active in this area during the year included Hudson Bay Exploration and Development Company Limited, Granges Exploration AB, Falconbridge Limited, Canadian Nickel Company Limited, Selco Inc., Manitoba Mineral Resources Ltd., SMD Mining Co. Ltd. and St. Joe Canada Inc.

Canadian Nickel Company Limited also carried out geochemical and geophysical surveys in the Mafeking area.

Sherritt Gordon Mines Limited was active in the *Lynn Lake-Ruttan Lake* region during the year with geological and geophysical surveys and diamond drilling. The provincial Mineral Resources Division has been actively engaged in geoscientific programs in this region for the last seven years with a view to enhancing the data base and stimulating exploration. Activities of the Division were intensified during the year.

Manitoba Mineral Resources Ltd. and File Explorco Limited (Selco) conducted geophysical surveys and drilling programs on a number of properties in the Russell Lake-Rat River-Notigi Lake-Harding Lake area.

In *Central Eastern Manitoba*, geological, geophysical and drilling programs were conducted by BP Minerals Limited on Island Lake; geological and geophysical surveys by Manitoba Mineral Resources Ltd. in the Beaver Hill Lake area; geological and geophysical surveys and drilling by SMD Mining Co. Ltd. in the Knee-Oxford Lakes area; and reconnaissance programs by Noranda Exploration Company Limited and Inco Limited at Island Lake.

In the *Thompson Nickel Belt*, exploration for nickel was maintained during the year with geophysical and drilling programs by Inco Limited and Falconbridge Limited; a geophysical program by Amax of Canada Limited in the Cedar Lake area; and diamond drilling by Granges Exploration AB in the Ponton area.

In *Southeastern Manitoba*, Falconbridge Limited undertook a drilling program on Lake Winnipeg near Black Island; Footloose Holdings Ltd. an airborne geophysical survey in the Interlake area; Canadian Nickel Company Limited geological, geophysical and drilling programs in the Bird River and Bissett areas; while File Explorco Limited (Selco) conducted an airborne geophysical survey in the Shoal Lake area.

Tantalum

Tantalum Mining Corporation of Canada Limited continued geological, geochemical and drilling investigations for tantalum and lithium in the Bird River area in *Southeastern Manitoba*.

Gold

Gold exploration remained at a high level in the province during 1982. Sherritt Gordon Mines Limited completed a shaft deepening program on the *Agassiz* property near Lynn Lake, optioned from Comiesa Corporation. During 1982 the company compieted 1800 feet surface drilling on the property.

Gold Fields Mining Corporation and Noranda Exploration Company Limited were involved in geological, geophysical and drilling programs in the *Flin Flon-Snow Lake* area.

Camflo Mines Limited conducted an airborne geophysical survey at Beaucage Lake near *Lynn Lake*.

In *Central Eastern Manitoba*, BP Minerals Limited, W. Bruce Dunlop Limited and a number of prospectors were active mainly in the Island Lake area.

In the Bissett area of *Southeastern Manitoba*, companies involved in various geological, geophysical and drilling programs included Esso Minerals Canada; Brinco Limited; Belmoral Mines Limited; Noranda Exploration Company Limited; Augusta Gold Mines Ltd; Canadian Nickel Company Limited; Sherritt Gordon Mines Limited and several prospectors.

Petroleum Branch

The Petroleum Branch administers provisions under The Mines Act dealing with exploration, development and production of oil and natural gas. The Branch conducts technical studies and provides technical assistance to The Oil and Natural Gas Conservation Board in matters relating to salt water disposal, enhanced recovery projects, unitization agreements, and other Board responsibilities. Assistance is also provided to The Mining Board in resolving disputes relating to surface rights.

The *Administration Section* of the Branch, located in Winnipeg, is responsible for administration of The Mines Act and regulations governing the disposition of Crown oil and natural gas rights, including sales of leases and exploration reservations by public tender; the collection of lease rentals and Crown oil royalties; and the recording and publication of statistics on crude oil and salt water production, salt water disposal, and information on wells drilled.

The *Engineering and Geology Section*, also located in Winnipeg, processes applications relating to drilling and production operations, oil and salt water pipe lines, underground storage of natural gas, and geophysical and drilling licenses. The Section also provides consultation to the petroleum industry and carries out special studies relating to Manitoba's oil and natural gas potential and reserves.

The Petroleum Inspection Section is located in Virden and is responsible for the inspection and monitoring of geophysical, drilling and production operations and investigation of complaints arising from petroleum operations. This Section also provides information to the petroleum industry and the general public.

The Petroleum Industry

Petroleum Production and Exploration

Drilling activity increased dramatically in 1982. One hundred and ninety five wells were drilled, representing a 215% increase over the 62 wells drilled in 1981. This renewed interest in Manitoba by petroleum exploration companies reflects initial discoveries made in 1980 and 1981 and the favourable economic environment provided through higher oil prices and the Provincial royalty/tax regime. Seventy-seven percent of all drilling took place in the Waskada area following continued drilling success in that area in 1981. Drilling activity also increased in the Coulter, Pierson and north Virden areas of the province.

Sales value of oil produced in 1982 increased by $36.5 million to $100.5 million due to increased wellhead prices coupled with increased oil production. For the first time in 14 years annual oil production increased during 1982. From 1981 to 1982 production increased 7.3% to 582 280m^3. This increase was due primarily to the successful ongoing development of the Waskada area.

Eighteen percent of provincial oil production was classified as New Oil as defined by the January 1, 1982 interim pricing agreement between the Federal Government and the Manitoba Government.

In January 1982, the average wellhead price for New Oil produced in Manitoba was $281.62/$m^3$, while the Old Oil price was $148.42/$m^3$. By January 1983, the New Oil price had dropped to $274.03/$m^3$ and the Old Oil price had increased to $184.65/$m^3$.

Total industry reported expenditures on oil and gas activity in the province (including exploration, drilling, provincial petroleum royalties and taxes, etc. but excluding income taxes) rose by $27.4 million in 1982, to $82.6 million.

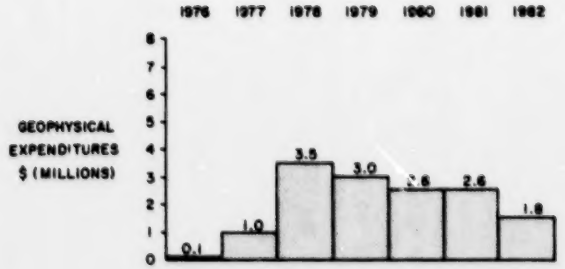
In 1982, expenditures associated with geophysical activity showed a 15% decrease from the previous year. However, the number of programs licensed in 1982 increased to 19 from 11 in 1981.

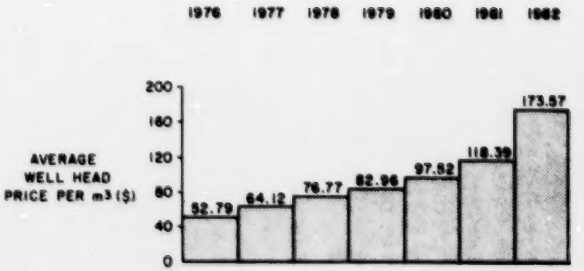
A total of 195 wells were drilled by 19 different oil companies in 1982, compared with 62 wells in 1981 and 27 wells in 1980. Not since 1957 have there been this many wells completed in a single year. One hundred and sixty-four of the 195 wells were completed as potential oil wells, representing an 84% success rate. Of the total number of wells completed, 117 were classified as development wells, while the remaining 78 were exploratory. The total metres drilled for all 195 wells in 1982 was 184 291. Two of the exploratory wells completed in 1982 were deep tests drilled through the entire sedimentary column to the Precambrian, while another 5 wells penetrated into Devonian formations.

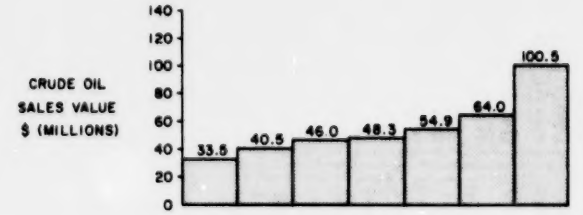
Omega Hydrocarbons Ltd. was the most active oil company in 1982, drilling a total of 94 wells in the Waskada area, all of which were completed as potential oil wells.

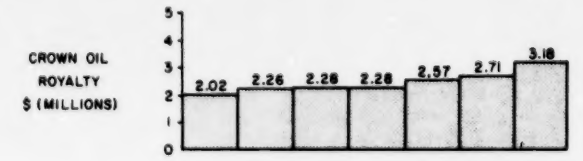
Roxy Petroleums Ltd. drilled 33 wells in 1982 in areas including Waskada, Goodlands, Deloraine, Whitewater, Souris and Hartney. Of these 33 wells, 27 were classified as exploratory and 19 were capable of oil production.

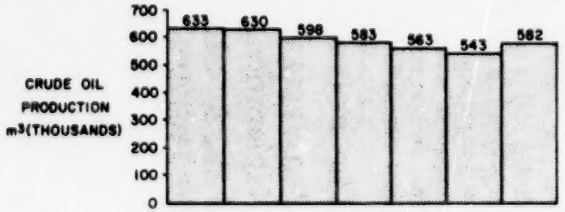
Performance of the Petroleum Sector
1976 - 1982

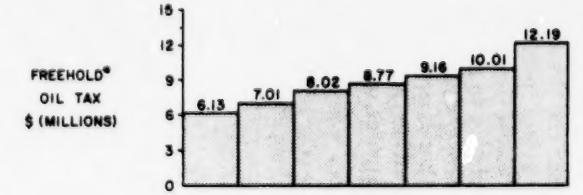












* APPROXIMATELY 80% OF OIL PRODUCTION IS FROM FREEHOLD MINERAL RIGHTS

A Winnipeg based company, New Scope Resources Limited, drilled 17 wells in the Waskada, Coulter, Daly and Cranmer areas in 1982. Twelve of these were development wells while the remaining 5 were classified as exploratory wells. Eighty-two percent or 14 of the company's wells were reported as capable of oil production.

Lease Sales

During 1982, Crown oil and natural gas lease sales were held on May 21 and October 27. Revenue received by the Crown from these sales totalled $1,074,588, comprising $1,055,668 in lease bonuses, $2,800 in fees, and $16,120 in rentals. Fifty-six lease parcels comprising 6 448 hectares were disposed of at these sales. No exploration reservations were sold in 1982.

New record prices per hectare were set at both sales in 1982. At the May sale, the highest price paid was $835.94 per hectare while at the October sale the highest price paid per hectare climbed to $938.88. The average prices per hectare realized in these two sales were $132.16 and $194.51 respectively. The results of the 1982 lease sales brought the total Crown lands under disposition at year end to 66 699 hectares (20 947 hectares in Exploration Reservations and 45 752 hectares under Lease).

Petroleum Royalites, Taxes and Other Revenues

During 1982, the Crown received approximately $3.2 million in royalties from Crown oil production and an additional $12.2 million from taxes levied on producing freehold mineral rights under The Oil and Natural Gas Tax Act.

An additional $215,000 was received as rental fees on existing Crown leases and Exploration Reservations while $8,950 was collected for registration and licensing fees.

Oil Pricing Agreement

In December 1981, the Federal Government and the Manitoba Government entered into discussions, which resulted in interim agreement being reached with regard to oil classification definitions and oil pricing for Manitoba production. As of January 1, 1982, for any quality of Manitoba "conventional old oil" the field price would be determined by deducting the appropriate transportation charge from the laid down price in Montreal of equivalent Alberta crude, the field price of which was set out in the September 1, 1981, Alberta-Canada Agreement.

Also effective January 1, 1982, "conventional new oil" produced in the Province of Manitoba qualified for the New Oil Reference Price (NORP) with the field price determined in the same manner as that employed for "conventional old oil".

The necessary Federal authorizations and Provincial administrative procedures were subsequently put into place to allow Manitoba producers to receive the new prices in 1982. Producers of "conventional new oil" receive the old oil price from the purchasing company plus an additional supplement funded by the Federal Government to make the combined total equal to the New Oil Reference Price (NORP). The Petroleum Branch administers the supplement programs on behalf of the Federal government.

By year end 1982, Manitoba New Oil production qualified for approximately $11.8 million in New Oil Reference Price and Special Old Oil Price supplements. This figure is expected to increase significantly throughout 1983 as more New Oil is discovered and put on production.

Manitoba Drilling Incentive Program

In 1982, the Manitoba Drilling Incentive Program was extended to January 1, 1987 from January 1, 1983 for new wells producing from Crown mineral rights. The program is designed to provide oil producers in Manitoba with a reduced Crown oil royalty and freehold tax rate for qualifying wells. (Bill 16 to amend The Oil and Natural Gas Tax Act, when passed, will retroactively extend the Drilling Incentive Program to January 1, 1987 for wells drilled on freehold lands.

Oil and Natural Gas Conservation Board

The Oil and Natural Gas Conservation Board is established under provisions of The Mines Act with powers to inquire into all matters relating to the drilling, production, transportation, and distribution of oil and gas in Manitoba. The Board conducts hearings and may make orders as specified under The Mines Act.

The Board held no hearings in 1982 but issued the following Board Orders:

Salt Water Disposal Permit No. 115 authorizing the conversion of the well New Scope Scallion SWD 11-8-11-26 WPM, for use as a salt water disposal well.

Salt Water Disposal Permit No. 116 authorizing the conversion of the well Saskoil et al W. Kirkella SWD 2-18-12-29 WPM, for use as a salt water disposal well.

Salt Water Disposal Permit No. 117 authorizing the conversion of the well Rundle Daly SWD 3-15-9-28 WPM, for use as a salt water disposal well.

Geological Services Branch

The Geological Services Branch comprises three sections: the Geological Survey, Draughting and Laboratory Services Sections.

The Geological Survey undertakes geological mapping, mineral deposit studies and other geoscientific investigations designed to provide an up-to-date geological framework and mineral data base for the Province for use in mineral resource appraisal, mineral exploration, land-use planning and in addressing environmental concerns.

The Laboratory Services provides the necessary rock preparation, warehousing and analytical support for the Division's geological and mineral evaluation activities while the Drafting Section is responsible for the drafting and preparation of all maps, graphs, charts and illustrations for the Mineral Resources Division.

A Report of Field Activities, and eight Preliminary geological maps were released on November 18 in conjunction with the Annual Meeting with Industry in Winnipeg. A total of 172 delegates from industry, universities, and other government agencies attended the meeting at which oral presentations were given by staff of the Mineral Resources Division, the Geological Survey of Canada and the Centre for Precambrian Studies, University of Manitoba. The nature and scope of geological, mineral deposit and geophysical investigations conducted in the Province were reviewed in the talks and in a concurrent Poster Session.

A total of 17 major field projects were mounted by the Geological Services Branch in 1982, in addition to numerous short-term investigations into mineral deposits, industrial minerals, and geological data-gathering related to compilation programs. The overall objective of the Branch continues to be the generation of geoscientific and mineral deposit data that will ensure the optimum utilization of the Province's mineral resources.

Close co-operation has been maintained with the Geological Survey of Canada in undertaking projects related to strategic minerals concerns, geophysical surveys and a concentration of effort in the Lynn Lake region.

Additional data and information were also generated through co-operative research with staff and analytical laboratories at the Universities of Manitoba, Alberta, Carleton, Montreal and Windsor. Assistance was provided to NASA geologists from the Lyndon B. Johnston Space Centre in Houston who are conducting research into terrestrial anorthosites for comparison with those from the moon.

Lynn Lake Programs

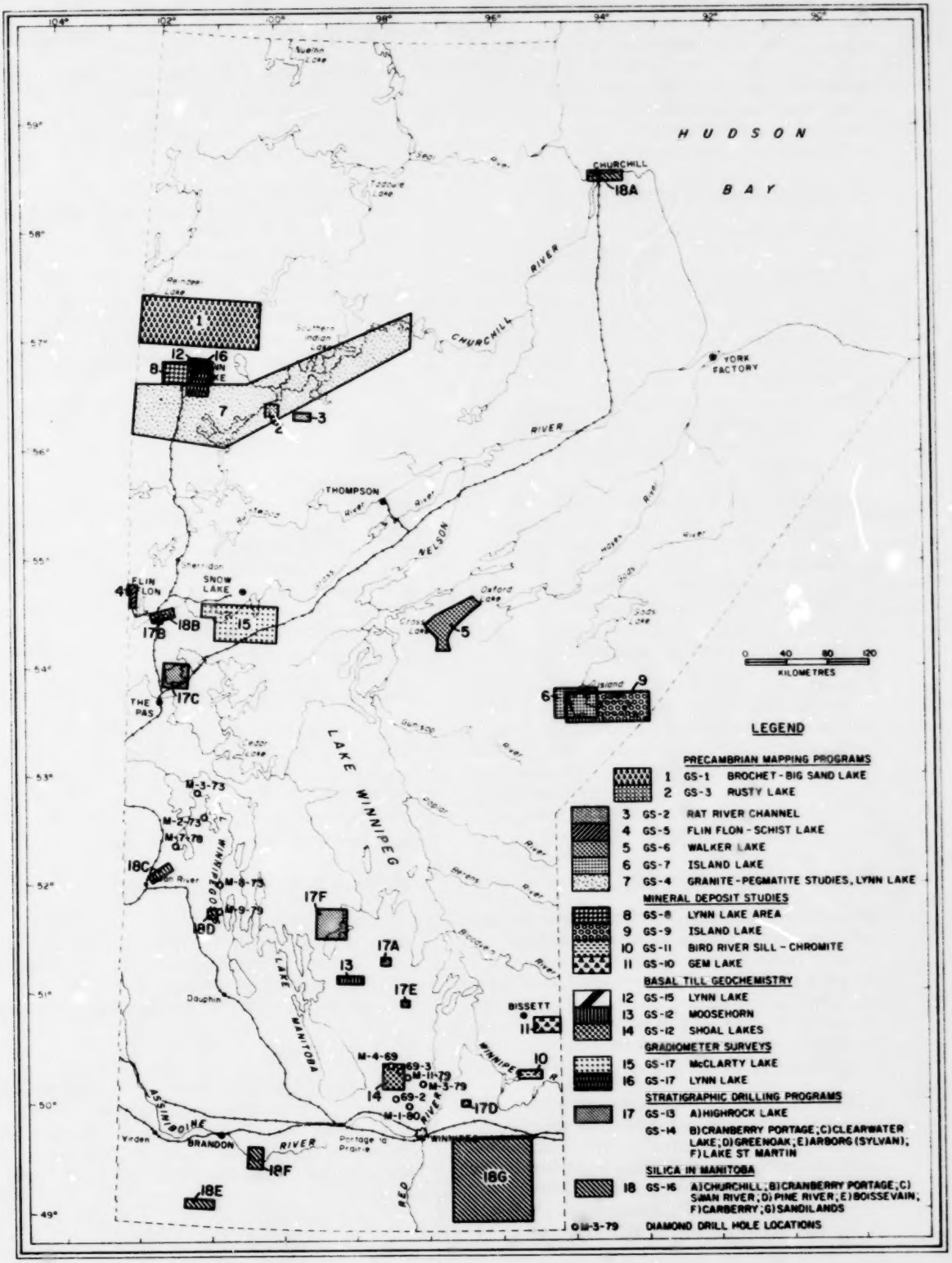
Branch activities were intensified at Lynn Lake as part of a multi-faceted program intended to stimulate and provide guidance to exploration in the region, and accelerate the evaluation of the district's residual mineral potential.

Jointly funded Federal/Provincial aeromagnetic gradiometer surveys in the McClarty Lake (Snow Lake) region (12 000 line km) were extended to include a 4 000 line km pilot study over Lynn Lake in order to determine whether the technique would provide better geological control than could be obtained from 1976 aeromagnetic data. The results of these surveys were released in March 1983 and November 1982 respectively, priority in processing having been given to the data from the Lynn Lake survey.

Mineral deposit studies focussed on a re-evaluation of drill core from the immediate Lynn Lake area and resulted in the identification of mineral assemblages diagnostic of alteration pipes, metal zonation, key stratigraphic sequences and lithologies diagnostic of exhalative mineralization. Basal tills, down-ice from the Agassiz gold deposit, were sampled with a backhoe to test the usefulness of this technique in the search for base and precious metals. These studies were augmented by extensive lithogeochemical sampling of this deposit and the Lynn Lake rhyolite.

Detailed geological mapping has been conducted in the region since the announced closing of the Farley Mine in 1976 and is now virtually complete. Brief surveys were conducted in the Rusty Lake area and east of the Rat River channel bringing to a conclusion the up-to-date 1:50 000 scale geological coverage of the greenstones from Saskatchewan to east of Karsakuwigamak Lake. The second year of more regional mapping immediately to the north in the Brochet/Big Sand area confirmed the widespread extent of paragneisses and granitic intrusions north of the Lynn Lake belt, identified an important 275°-trending linear zone of cataclasis, mylonitization and associated pseudotachylite running through Le Clair Lake, and confirmed the suspected occurrence of high grade recrystallized volcanic rocks in the Paskwachi Bay region.

An evaluation of the granites and pegmatites between Thorsteinson Lake and Tod Lake indicated little, if any, potential for rare elements and related minerals other than minor occurrences of tourmaline and beryl.



Map 2 Location of Field Projects 1982

The Geological Survey of Canada joined with the Manitoba Survey in mounting a geochronological uranium/lead zircon study of key units in the Lynn Lake belt. The GSC also undertook, on a trial basis, several pulse electromagnetic surveys near Lynn Lake as part of a more wide-ranging study of deep conductors to be continued in 1983.

Precambrian Mapping

In the *Flin Flon* belt detailed geological mapping near *Schist Lake* confirmed the widespread occurrence of subaqueous volcanic flows, and repeated faulting which constitutes a major impediment to a stratigraphic synthesis of the area. Notwithstanding the complexity of the structure and difficulty in correlating between fault blocks, extensive zones of hydrothermal alteration (silicification, etc.) are interpreted to indicate a high potential for additional occurrences of base metal mineralization.

Geological mapping at *Island Lake*, in the Superior Province, was conducted partly in support of detailed geochemical sampling and mineral deposit investigations of the gold occurrences in the area. Significant for gold exploration, was the identification of thick turbidite sequences overlying the basal conglomerates of the Island Lake Group.

Mapping at *Walker Lake* delineated the western limits of the Gods-Oxford Lakes Belt greenstones and provided additional data which confirmed the regional structural interpretation and the gradational relationships between the Superior Province and Pikwitonei granulites. Rare element pegmatites of the Cross Lake type were not encountered.

Mineral Deposit Studies

In southeast Manitoba, the base metal potential and possible exhalative association of felsic volcanic rocks at Gem Lake was evaluated and detailed channel sampling was conducted across the Bird River Sill, and on selected properties, as part of a *platinum metals group* and *chromite resource evaluation* being conducted with the co-operation of the Geological Survey of Canada.

Additional basal till and soil samples were collected in the southern Interlake area to determine the source area of rare float *galena* pebbles, another of which was identified in the Swan River area in the spring of 1982. A geochemical study of Paleozoic drill core is also being conducted as part of this program.

Industrial Minerals and Stratigraphic Drilling Program

An investigation of quartzites at Churchill and sands at Boissevain, Swan River, Black Island, the Whiteshell, south of Delta and in other areas, completed a two-year evaluation of *silica resources* in the Province.

The Branch's stratigraphic drilling program during 1982, in which 13 holes were drilled for a total of 931.72 m, provided new data on the High Rock Lake Precambrian inlier, and a prominent linear gradiometer anomaly south of Cranberry Portage. At High Rock Lake the drilling has enabled the reconstruction of a probable impact crater in which distinct "tectonized" zones can be provisionally delineated, including an excavated central crater zone with possible relief of up to 500 m.

Laboratory Services

The Analytical Laboratory supported the private sector by preparing 1,194 samples for assay and carrying out 4,353 assays for precious and base metals free of charge. One hundred and twenty-two (122) spectrographic determinations were also completed. The Analytical Laboratory carried out 13,027 silicate determinations for the Geological Services Branch and provided 147 determinations for sulphur and specific gravity on crude oil samples submitted by the Petroleum Branch.

The Geochemistry Section of the laboratory carried out 12,960 determinations for trace elements and 292 determinations on oil field waters submitted by the Petroleum Branch. Five hundred and thirty five (535) drill core samples were prepared for analysis.

Rock Preparation Laboratory

During the year ending March 31, 1983 the Rock Preparation Laboratory completed 1,480 thin sections, 203 stained slabs, 43 polished slabs and 5 polished sections, as well as preparing 1,254 samples for chemical analyses.

Publications

Publications issued, at press, or in preparation and oral presentations given by professional staff during the year are listed in Table 9 of the Statistical Supplement. A list of Preliminary Maps issued during the year is given in Table 10.

STATISTICAL SUPPLEMENT
1982/83

TABLE 1
Comparison of Manitoba Mineral Production and Value
1981 and 1982

	1981 (Jan - Dec)			1982 (Jan - Dec)		
	Quantity (Imperial)	Value ($ 000)	Quantity (Metric)	Quantity (Imperial)	Value ($ 000)	Quantity (Metric)
Metals	(000 lb)		(000 kg)	(000 lb)		(000 kg)
Cadmium	46	103	21	83	114	37
Cobalt	549	13,990	249	667	10,296	303
Copper	123,421	123,878	55 983	107,608	95,243	48 810
Lead	1,059	471	480	1,610	530	730
Nickel	66,092	234,490	29 979	57,357	171,665	26 017
Selenium	100	1,539	45	67	315	31
Tantalum	229	23,165	104	131	7,243	59
Tellurium	11	172	5	10	148	5
Zinc	87,172	47,282	39 540	69,302	33,730	31 435
Precious Metals	(000 tr oz)		(000 g)	(000 tr oz)		(000 g)
Gold	42	23,108	1 304	56	25,852	1 729
Silver	827	10,438	25 732	815	8,014	25 355
TOTAL METALS		478,636			353,150	
Industrial Minerals	(000 ton)		(000 tonne)	(000 ton)		(000 tonne)
Clay Products	–	5,537	–	–	6,223	–
Cement	739	53,835	670	360	34,666	327
Gypsum	222	2,450	202	120	2,006	109
Lime	–	4,450	–	–	4,196	–
Peat Moss	86	11,356	78	48	7,840	44
Quartz	122	2 284	111	160	1,952	145
Sand/Gravel	12,915	25,424	11 716	11,337	28,054	10 284
Stone	2,034	9,853	1 845	2,585	11,670	2 345
TOTAL INDUSTRIAL MINERALS		115,189			96,607	
Fuels	(000 bbl)		(000 m^3)	(000 bbl)		(000 m^3)
Petroleum	3,415	64,055	543	3,664	100,537	582
GRAND TOTAL		657,880			550,294	

Sources: Energy, Mines and Resources, Ottawa
Manitoba Department of Energy and Mines

TABLE 2

A Comparison of Value of Manitoba Metals, Industrial Minerals, Fuels and Total Mineral Production From 1972 - 1982 (Calendar Year) ($000)

Year	Metals	Industrial Minerals	Fuels	Total
1972	272,974	35,730	14,583	323,287
1973	363,650	38,416	17,148	419,215
1974	413,530	45,556	27,169	486,255
1975	452,236	50,662	31,451	534,349
1976	412,301	69,173	33,557	515,031
1977	446,691	81,597	40,428	568,716
1978	338,123	83,696	45,937	467,756
1979	510,049	94,279	48,403	652,731
1980	664,809	100,814	54,948	820,571
1981	478,636	115,189	64,055	657,880
1982	353,150	96,607	100,537	550,294

TABLE 3
Mineral Dispositions in Good Standing at Calendar Year End 1978 to 1982

Mining	1978		1979		1980		1981			1982		
	No.	Acres	No.	Acres	No.	Acres	No.	Acres	Hectares	No.	Acres	Hectares
Mining Claims	4,238	185,928	4,157	181,215	2,996	125,020	6,875	1,835,039	742 614	6,308	1,705,997	690 392
Claim Blocks*	2,184	881,080	2,820	1,165,472	3,551	1,479,657	—	—	—	—	—	—
Order in Council Leases	4,184	295,000	4,184	295,000	4,184	295,000	4,184	295,000	119 382	4,184	295,000	119 382
Permits	13	576,513	8	356,096	14	956,282	13	723,570	292 818	8	694,463	281 039
Explored Area Leases	36	33,463	38	34,201	39	34,409	38	35,513	14 372	38	35,513	14 372
Production Leases	24	37,278	22	29,713	27	29,993	29	31,336	12 681	28	31,296	12 665
Miscellaneous Mineral Leases	—	—	—	—	1	996	1	996	403	1	996	403
Potash												
Permits	—	—	—	—	1	43,390	1	43,390	17 559	1	33,310	13 480
Quarrying												
Leases	171	12,914	241	20,221	275	22,717	302	23,670	9 579	360	26,178	10 594
Exploration Permits	17	2,826	6	734	10	2,305	13	2,336	945	9	2,014	815
Peat												
Leases	13	6,563	15	6,606	14	6,468	13	6,466	2 617	18	8,225	3 329
Exploration Permits	2	802	—	—	—	—	8	4,347	1 759	9	3,087	1 249
Total	10,882	2,032,267	11,491	2,089,258	11,112	2,996,237	11,477	3,001,663	1 214 729	10,964	2,836,079	1 147 720

**Manitoba Regulation 147/81, which came into effect July 11, 1981, discontinued the use of the term "claim blocks".*

TABLE 4
Mineral Dispositions Issued Each Calendar Year 1978 to 1982

Mining	1978		1979		1980		1981			1982		
	No.	Acres	No.	Acres	No.	Acres	No.	Acres	Hectares	No.	Acres	Hectares
Mining Claims	24	906	206	8,126	134	5,131	1,318	553,133	223 845	643	285,908	115 703
Claim Blocks*	889	392,821	1,061	478,199	1,114	493,971	—	—	—	—	—	—
Permits	3	111,083	6	298,771	8	742,767	3	231,944	93 864	5	491,347	198 841
Explored Area Leases	1	1,882	2	738	1	208	1	1,872	758	—	—	—
Production Leases	1	44	2	80	5	280	3	1,383	560	—	—	—
Miscellaneous Mineral Leases	—	—	—	—	1	996	—	—	—	—	—	—
Potash												
Permits	—	—	—	—	1	43,390	—	—	—	—	—	—
Quarrying												
Leases	98	6,725	70	7,092	48	3,327	39	1,900	769	70	5,045	2 042
Exploration Permits	4	724	3	539	7	1,895	5	439	178	1	1,947	788
Casual Permits	57	—	84	—	96	—	77	—	—	78	—	—
Permissions to Remove	428	—	407	—	381	—	416	—	—	528	—	—
Peat												
Leases	8	4,380	2	259	—	—	—	—	—	5	1,759	712
Exploration Permits	2	802	—	—	—	—	8	4,347	1 759	3	1,307	529

**Manitoba Regulation 147/81, which came into effect July 11, 1981, discontinued the use of the term "claim blocks".*

TABLE 5
Revenue from Mining and Quarrying
(to March 31)

	1981/82	1982/83
Disposition and other fees, rentals, forfeiture of deposit, cash payments in lieu of work commitment, sale of maps, etc.	$ 440,029	$ 368,287
Mining Claim Lease Tax	76,566	76,616
Royalities *(from industrial minerals under The Mines Act, M 160)*	591,813	463,066
The Mining Royalty and Tax Act *(M 180)**	5,969,094	554
The Mining Tax Act *(M 125)*	8,768,797	224,000
Total	$15,846,299	$1,132,523

**Collection of a royalty under The Mining Royalty and Tax Act was discontinued after December 31, 1980. The revenue shown represents reassessments for the period prior to that date.*

TABLE 6
(1973 - 1982)
Manitoba Petroleum Statistics
(Calendar Year)

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Geophysical Licenses Issued	–	–	1	3	2	5	10	9	11	19
Expenditures ($)	–	–	106,500	118,308	1,046,220	3,451,370	3,000,000	2,600,000	2,600,000	1,640,023
Drilling Licenses Issued	19	22	9	16	21	16	27	27	71	201
New Wells Drilled	17	22	11	16	13	22	25	27	62	195
New Oil Producers	–	7	2	3	7	10	11	18	38	145
New Wells Abandoned	17	14	8	10	2	6	9	9	15	30
Metres Drilled	14 081	23 784	8 805	13 515	11 584	18 329	20 537	23 508	61 011	184 291
Wells Capable of Production (Dec.)	882	871	831	821	804	808	811	823	853	1,002
Wells Producing (December)	719	714	686	688	701	703	705	720	748	896
Previous Producers Abandoned	16	30	12	24	7	3	4	5	5	11
Other Wells Abandoned	2	3	1	3	1	2	1	0	3	8
Crude Oil Production (m^3)	807 882	754 667	701 459	633 322	630 466	598 354	583 377	563 482	542 695	582 283
Water Production (m^3)	3 985 577	3 994 539	3 977 222	4 021 932	4 228 083	4 075 178	3 946 337	4 171 051	4 565 210	4 581 786
Total Fluid Production (m^3)	4 793 459	4 749 206	4 678 681	4 655 254	4 858 549	4 673 532	4 529 714	4 734 533	5 107 705	5 163 997
% Water Cut	83	84	85	86	87	87	87	83	89	89
Average Oil Production (m^3 per day)	2 213	2 068	1 922	1 730	1 727	1 639	1 598	1 540	1 487	1 595
Total Oil Sales ($)	17,155,080	27,181,792	31,452,592	33,532,609	40,457,038	45,953,383	48,403,312	54,948,288	64,054,832	100,537,270
Crown Oil Royalty ($ received)	403,729	1,598,907	1,823,361	2,023,828	2,263,015	2,281,355	2,280,162	2,574,515	2,714,733	3,175,625
Freehold Mineral Tax ($ received)	143,572	5,216,314	6,498,072	6,128,261	7,012,188	8,017,968	8,768,511	9,159,426	10,005,107	12,194,350
Total Crown Revenue ($ received)	547,301	6,815,221	8,321,433	8,152,089	9,275,203	10,299,323	11,048,673	11,733,941	12,719,840	15,369,975
Average Well Head Price per m^3 ($)	21.21	35.99	44.86	52.79	64.12	76.77	82.96	97.52	118.39	173.57
Reservation Sale Bonuses ($)	–	–	(last sale held in 1969)		–	–	40,888	820,345	611,199	–
Lease Sale Bonuses ($)	–	–	(last sale held in 1971)		–	–	897,895	1,057,530	1,074,958	1,055,700
Reservation and Lease Rentals & Fees ($)	11,934	15,009	11,700	10,766	10,237	10,198	49,300	133,635	191,409	235,812
Crown Reservation Area (ha)	–	–	–	–	–	–	4 736	16 915	22 291	20 947
Crown Lease Area (ha)	15 910	8 108	7 213	6 954	6 759	6 759	22 559	29 519	40 806	45 752
Total Crown Area Under Dispostion (ha)	15 910	8 108	7 213	6 954	6 759	6 759	27 295	46 434	63 097	66 699
Industry Reported Total Expenditures ($)	6,000,000	12,500,000	13,900,000	14,600,000	18,900,000	27,900,000	31,000,000	38,300,000	55,200,000	82,600,000

Certain Petroleum Industry Figures are Estimates

TABLE 7

1982

Oil and Water Production Summary

(cubic metres)

Field	Cum. Oil to Dec. 31/81	Oil Produced 1982	Cum. Oil to Dec. 31/82	Cum. Water to Dec. 31/81	Water Produced 1982	Cum. Water to Dec. 31/82	Producing Wells as at December 31/82	
							Capable	Actual
Daly Unit #1	902 642.5	23 355.1	925 997.6	2 361 998.5	155 028.2	2 517 026.7	38	30
Daly Unit #3	1 200 991.1	28 203.7	1 229 194.8	994 937.2	36 071.4	1 031 008.6	57	44
Daly Non-Unit	1 056 233.9	11 947.3	1 068 181.2	9 224 001.4	412 272.6	9 636 274.0	49	37
Ebor Unit #1	45 013.6	1 092.8	46 106.4	12 163.7	677.9	12 841.6	7	7
Ebor Non-Unit	37 539.6	780.2	38 319.8	45 512.3	661.7	46 174.0	3	3
Kirkella Field	128 116.9	2 972.5	131 089.4	982 901.1	74 870.6	1 057 771.7	8	8
Lulu Lake Field	32 451.6	1 271.7	33 723.3	138 022.4	10 337.2	148 359.6	4	4
Maples Field	126 299.7	2 040.5	128 340.2	2 413 047.5	117 600.8	2 530 648.3	8	6
North Virden Scallion Unit #1	7 863 358.0	188 052.8	8 051 410.8	9 556 166.6	622 647.5	10 178 814.1	183	174
North Virden Scallion Non-Unit	981 831.4	18 769.1	1 000 600.5	8 219 138.0	479 347.3	8 698 485.3	57	45
Northwest Pierson Field	19 144.3	338.9	19 483.2	61 120.6	3 427.3	64 547.9	5	2
Pierson Field	103 500.8	3 644.7	107 145.5	283 826.4	25 945.7	309 772.1	10	9
Routledge Unit #1	1 772 551.0	31 566.1	1 804 117.1	9 767 197.4	615 566.7	10 382 764.1	82	81
East Routledge Unit #1	379 165.2	12 611.8	391 777.0	1 067 847.2	99 717.6	1 167 564.8	20	20
Routledge Non-Unit	53 528.9	1 859.6	55 388.5	209 010.1	3 235.7	212 245.8	2	1
Souris Hartney Field	119 480.0	2 836.5	122 316.5	193 968.9	13 896.0	207 864.9	8	7
Tilston Field	69 809.0	3 288.2	73 097.2	478 410.6	3 197.7	481 608.3	11	7
Virden-Roselea Unit #1	1 819 345.9	51 728.2	1 871 074.1	3 983 591.9	401 177.2	4 384 769.1	62	62
Virden-Roselea Unit #2	761 840.1	22 009.7	783 849.8	3 402 108.1	194 526.2	3 596 634.3	36	36
Virden-Roselea Unit #3	1 862 170.0	42 177.0	1 904 347.0	7 727 559.5	612 894.1	8 340 453.6	76	75
Virden-Roselea Non-Unit	1 102 747.2	14 036.6	1 116 783.8	9 091 463.4	480 340.4	9 571 803.8	38	29
Waskada Unit #1	61 692.2	741.8	62 434.0	25 462.7	6 083.3	31 546.0	5	2
Waskada Non-Unit	60 536.4	42 758.9	103 295.3	26 332.0	15 499.3	41 831.3	50	48
West Butler Unit #1	28 902.3	510.4	29 412.7	6 521.0	—	6 521.0	2	2
West Kirkella Field	19 283.8	4 821.0	24 104.8	62 780.6	31 605.1	94 385.7	12	11
Whitewater Unit #1	72 790.6	858.4	73 649.0	24 083.4	5 977.8	30 061.2	4	4
Woodnorth Field	149 041.0	636.0	149 677.0	391 052.4	15.8	391 068.2	5	5
Other Areas	262 115.3	67 373.2	329 488.5	1 180 888.9	159 459.8	1 340 348.7	160	137
Total	21 092 122.3	582 282.7	21 674 405.0	71 931 113.8	4 582 080.9	76 513 194.7	1 002	896

TABLE 8
Crude Oil Sales, Deliveries, Transporter's Disposition
1982

Producers Disposition

Field	Production	Opening Inventory	Adjustment	Closing Inventory	Sales (m^3)	Value of Sales
Daly	63 506.1	691.5	+ 130.8	814.6	63 513.8	$ 9,768,275
Ebor	1 873.0	98.0		91.1	1 879.9	287,406
Kirkella	2 972.5	134.5		108.7	2 998.3	439,956
Lulu Lake	1 271.7	105.9	+ 12.9	184.0	1 206.5	182,325
Maples	6 709.1	199.5	+ 106.9	1 340.2	5 675.3	867,166
North Virden Scallion	207 419.8	1 343.4	-31.5	1 535.4	207 196.3	31,860,157
Northwest Pierson	338.9	25.2		16.9	347.2	53,429
Pierson	3 644.7	84.4	-27.8	153.2	3 548.1	533,014
Routledge	46 037.5	402.3		267.3	46 172.5	7,115,721
Souris Hartney	2 836.5	98.8		70.8	2 864.5	421,868
Tilston	3 288.2	56.0		184.1	3 160.1	478,153
Virden-Roselea	130 204.0	1 160.1	-16.6	1 192.3	130 155.2	20,050,219
Waskada	53 550.1	870.8	-207.0	1 242.7	52 971.2	8,084,009
West Butler	510.4	31.3		42.8	498.9	75,337
West Kirkella	5 064.8	182.1		165.2	5 081.7	738,325
Whitewater	858.4	15.2		86.2	787.4	117,378
Woodnorth	636.0	62.3	-133.9	65.6	498.8	75,747
Other Areas	51 561.0	1 467.3	-42.2	2 299.4	50 686.7	7,632,633
Total	582 282.7	7 028.6	-208.4	9 860.5	579 242.4	$88,780,118

Deliveries to Transporters

Sales – Production	579 242.4	
– Saskatchewan	44 513.7	623 756.1

Transporters' Disposition

Opening Inventory (Norcen)	2 409.0
Opening Inventory (Inter-provincial Pipeline)	16 863.4
Transporters Receipts	623 756.1
	643 028.5

Transporters' Deliveries

Manitoba:	Winnipeg – Shell	–
Ontario:	Bronte – BP	8 689.8
	Sarnia – Imperial	173 531.1
	Corunna – Shell	–
	Nanticoke – Texaco	18 303.8
Quebec:	Montreal – Shell	316 489.2
	Montreal – Sunoco	54 842.2
U.S.A.:	Minnesota – Koch	57 464.8
Closing Inventory (Norcen)		2 376.3
Closing Inventory (Inter-provincial Pipeline)		12 561.9
Adjustment		(1 230.6)
		643 028.5

TABLE 9

List of Reports and Presentations - 1982-83
Mineral Resources Division

Publications:

June 7, 1982
Geological Paper GP80-1
Geology of the Metavolcanic and Volcaniclastic Metasedimentary Rocks in the Lynn Lake Area; 188 pages, 19 figures, 26 tables and 5 maps .....
— H. P. Gilbert, E.C. Syme and H. V. Zwanzig

Open File Report OF81-1
Interpretation of an Aeromagnetic Survey in the Lynn Lake Area; 115 pages, 46 figures, 9 tables and 8 maps .....
— D. H. Hall, T. Millar and K.H. Mok

Open File Report OF81-4
Mineral Deposits in the Ruttan Lake, Karsakuwigamak Lake, Muskayk Lake Areas; 59 pages, 3 figures and 1 map.....
— D.A. Baldwin

Open File Report OF81-5
Summary and Evaluation of the Geophysical Data from the Open Assessment Files of the Lynn Lake Greenstone Belt; 40 pages, 2 tables and 15 maps .....
— I.T. Hosain

November 1, 1982
Open File Report OF82-1
Chromite Reserves and Geology of the Bird River Sill, Manitoba; 73 pages, 34 figures and 9 tables .....
— B.B. Bannatyne and D.L. Trueman

November 18, 1982
Report of Field Activities 1982 — Mineral Resources Division staff

Oral Presentations

May, 1982: Joint Annual Meeting of the Geological Association of Canada/Mineralogical Association of Canada, Winnipeg:

Gale, G.H., Metallogeny of the Proterozoic of Manitoba and Northeastern Saskatchewan.

Groom, H., Matile, G., Nielsen, E., and Young, R.V., Surficial Geology of Manitoba (Poster Session).

Lewry, J.F.*, Sibbald, T.I.I., and Schledewitz, D.C.P., Variations in Character of Archean Basement in the Western Churchill Province, and its Significance.

Nielsen, E., Observations on the distribution of Proterozoic Erratics in Manitoba.

Nielsen, E. and Kroker, S.*, The Drainage of Lake Agassiz and the Post-glacial Revegetation of a Part of Northeast Manitoba.

Weber, W., Gilbert, H.P. and Hubregtse, J.J.M.W., The Unconformity between the Hayes River Group and the Oxford Lake Group in the Northwestern Superior Province, Manitoba: Regional Significance and Implications for Archean Crustal Development.

Zwanzig, H.V., and Schledewitz, D.C.P., Tectonic Framework of the Churchill Province in Manitoba and Northeastern Saskatchewan.

Zwanzig, H.V., Evaluation of contrasting terrains in the southwestern Churchill Province.

*External co-author

TABLE 10

List of Preliminary Geological Maps – 1982

Precambrian Geology

1982M	Brochet-Big Sand (64F) ..... by D.C.P. Schledewitz and H.D.M. Cameron	1:250 000
1982W	Flin Flon-Schist Lake ..... (Parts of 63K/12,13) by A.H. Bailes and E.C. Syme	1:20 000
1982N-1	Walker Lake-Fairy Lake..... (63 I/10W 1/2, 11E 1/2) by J.J. Macek and F.G. Zimmer	1:50 000
1982N-2	Bjornson Lake-Walker Lake ..... (63 I/15S 1/2) by F.G. Zimmer and J.J. Macek	1:50 000
1981I-1	Waasagomach (53E/15NW) ..... by W. Weber, C.R. McGregor and K.L. Neale	1:20 000
1982I-2	Garden Hill (53E/15NE) ..... by K.L. Neale, W. Weber and C.R. McGregor	1:20 000
1982I-3	St. Theresa Point (53E/15SW) ..... by C.R. McGregor and W. Weber	1:20 000
1982I-4	Island Lake (53E/15SE)..... by H.P. Gilbert, K.L. Neale, W. Weber and M.T. Corkery	1:20 000

Surficial Geology

1982FB	Surficial Geology of Fisher Branch Area (Parts of 62P/3, 4 and part 62I/13, 14): ..... by H. Groom	1:100 000
1982DM-1	Surficial Geology of the Delta Marsh Area (62J/1 and parts 62J/2, 8):.. by P. Mitchell	1:50 000
1982DM-2	Surficial Geology of the Delta Marsh Area (southeast portion part 62I/4 and 62H/13): ..... by P. Mitchell	1:50 000